



The Genus *Pyrausta* Schrank (Lepidoptera: Crambidae: Pyraustinae) from Korea, with Description of a New Species

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Abstract In a review of the genus *Pyrausta* (Lepidoptera: Crambidae: Pyraustinae) in the Korean peninsula, 12 species including three species of North Korea are recognized. Among them, *P. nigrimaculata* Bae et Kim is described as new to science, and *P. chrysitis* Butler is reported for the first time from Korea. A Key to species of the genus, based on the external characters, is provided. Morphological descriptions with illustrations of the genitalia for the all known species are given.

Key words *Pyrausta nigrimaculata*, Syatematics, fauna

INTRODUCTION

Genus *Pyrausta* Schrank, 1802 is a type genus of Pyraustinae and world widely distributed. The genus comprises about 500 described species in the world except Antarctic continent (Robinson, 1994). Most of larvae webs and often rolls leaves together, shoots, and flower heads of herbaceous plants, and contains many notorious cosmopolitan pests of the agricultural crops. Most of the species, but not all, are related to members of the mint family Labiatae (Munroe, 1976). The first report for the Korean fauna of *Pyrausta* was made by Leech (1901), based on reports of *P. cespitalis* (Denis et Schifferrmüller) (= *P. neocespalis* Inoue) and *P. tithionalis* Zeller. Recent works for the genus in Korea were made by Park (1976, 1979, 1983) and Bae (2001). Up to date, 12 species including two undetermined species have been recorded from the Korean peninsula (Bae, 2001). In this study, a taxonomic review of the genus in Korea are provided, with description of a new species, *nigrimaculata* Bae et Kim and report of *P. chrysitis* Butler for the first time from Korea. Description or redescrptions of the species are provided, with host plants, illustrations of adults and genitalia, and key to the species, based on the external characters are given.

Material examined for the study are based on 202 specimens collected by using light trap from 88 different sites throughout the country. Abbreviations for the depository of specimens and the provincial names are as follows: [UIB] Department of Biology, University of Incheon, Incheon; [CIS] Center for Insect Systematics, Kangwon National University, Chuncheon; [NIAS] National Institute of Agricultural Science and Technology, Suwon; [FRI] Forestry Research Institute; [GSNU] Department of Biology, Gyeongsang National University; GW- Gangweondo; GG- Gyeonggido; CB- Chungcheong-bukdo; CN- Chungcheong-namdo;

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GB – Gyeongsang-bukdo; GN – Gyeongsang-namdo; JB – Jeonla-bukdo; JN – Jeonla-namdo; JJ – Jeju.

Genus *Pyrausta* Schrank, 1802

Pyrausta Schrank, 1802, Fauna Boica 2: 163. Type species: *Phalaena Pyralis cingulata* Linnaeus, 1758 (subsequent designation) – Grote, 1895: 173.

Synonyms with type species: See to Bae, 2001: 133.

Adults (Figs. 1–15). Small to medium in size; wingspan 14–20 mm. Antenna filiform in both sexes; cilia of flagellum with different length on each species. Body generally slender, abdomen somewhat exceeding anal angle of hindwing. Legs slender; midfemur thickened in male; outer spur shorter than inner one. Forewing subtriangular; discal cell moderate in size; R_3 and R_4 stalked; R_5 straight and not basally approximated to R_{3+4} ; M_2 , M_3 and Cu_1 variably spaced around posterior angle of cell. Hindwing rounded; $Sc+R_1$ anastomosed with Rs . Rs and M_1 stalked; discal cell concave distally, with posterior angle of cell prolonged; M_2 , M_3 and Cu_1 spaced at posterior angle, sometimes approximated.

Male genitalia (Figs. 17–22). Uncus well-developed, broad basally; apex with numerous hairs. Tegumen variable in length, but not inflated. Valva simple; costa and ventral margin usually near parallel and weakly dorsally curved, more or less rounded at apex; sacculus simple, basally broad; processes of harpe sometimes complex. Transtilla convex at both edges and concave at middle. Juxta small, strong sclerotization. Saccus rather short, pointed at apex. Aedeagus straight or curved stick-like; cornuti variable, thorn-like.

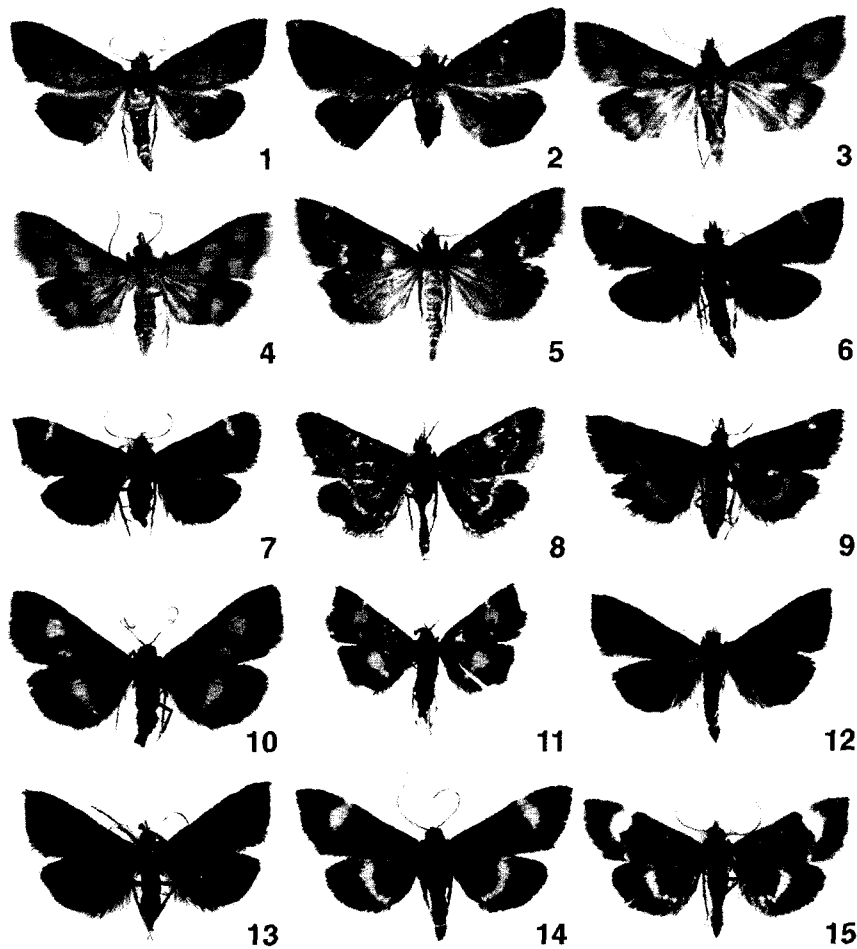
Female genitalia (Figs. 23–31). Ostium bursae membranous, partly sclerotized. Ductus bursae long and short, mostly coiled. Ductus seminalis membranous, usually originating from posterior part of ostium bursae. Corpus bursae mostly bulb-shaped or pyriform; appendix bursae present with variable origination; signum one, variable in size, mostly rhomboid or asteroid, with a sclerotized line at middle.

Distribution. All zoogeographical distribution except for the Antarctic continent, comprising about 500 species (Robinson, 1994). About 70 species in Palearctic and 300 species occur in Nearctic and Neotropical regions.

Remarks. The *Pyrausta* has a typical venation of the subfamily Pyraustinae, but there is no evident peculiarities to distinguish from other genera.

Key to the species of *Pyrausta* Schrank based on external characters

1. Fore- and hind wings ground color dark fuscous grayish brown 2
 - Fore- and hind wings ground color ochreous grayish brown 8
2. Hindwing with distinct yellowish band 3
 - Hindwing without distinct yellowish band 7
3. Hindwing with narrow subterminal line *neocespalis* Inoue
 - Hindwing without narrow subterminal line 4
4. Yellowish postmedian line of hindwing curved outwardly 5
 - Yellowish postmedian line of hindwing rapidly narrower dorsally 6
5. Postmedian area of forewing with a large round spot *aurata* (Scopoli)
 - Postmedian area of forewing with a large rhomboidal spot *nigrimaculata* sp. nov.
6. Postmedian line of forewing extended to costa and posterior margin *mutuurai* Inoue
 - Postmedian line of forewing not extended to costa and posterior margin *chrysitis* Butler
7. Forewing with yellowish fascia near discal cell *unipunctata* Butler
 - Forewing without yellowish fascia near discal cell *limbata* (Butler)
8. Postmedian line of forewing broad (broader than 2 mm) 9



Figs. 1-15. *Pyrausta* spp., adults: 1. *P. fuliginata* Yamanaka, ♂; 2. *P. fuliginata* Yamanaka, ♀; 3. *P. panopealis* (Walker), ♂; 4. *P. panopealis* (Walker), ♀; 5. *P. tithionalis* Zeller, ♂; 6. *P. unipunctata* Butler, ♂; 7. *P. unipunctata* Butler, ♀; 8. *P. neocespalis* Inoue, ♂; 9. *P. neocespalis* Inoue, ♀; 10. *P. chrysitis* Butler, ♀; 11. *P. mutururai* Inoue, ♀; 12. *P. limbata* (Butler), ♂; 13. *P. limbata* (Butler), ♀; 14-15. *P. nigrimaculata* Bae et Kim, sp. nov., ♂.

- Postmedian line of forewing narrow (narrower than 1 mm) 10
- 9. Postmedian line of forewing gold; hindwing with a postmedian line *panopealis* (Walker)
- Postmedian line of forewing light reddish brown; hindwing without a postmedian line
- *contigualis* South
- 10. Forewing ground color reddish brown; inside of antemedian line strong reddish
- *yellow tithionalis* Zeller
- Forewing ground color grayish brown or light yellowish brown 11
- 11. Wings with an antemedian line; postmedian line of forewing curved
- *fuliginata* Yamanaka
- Wings without an antemedian line; postmedian line of forewing straight

noctualis Yamanaka***Pyrausta fuliginata* Yamanaka, 1978** 검정각시들명나방

(Figs. 1-2, 16-17, 23)

Pyrausta fuliginata Yamanaka, 1978, Tinea 10: 193; Inoue, 1982, 1: 366, 2: 241, pl. 44: 1, 2; Park, 1983, Ins. Kor. series 3: 127; Park, 1993: 158; Bae, 2001: 134. TL: Japan.

Diagnosis. Wingspan 15–19 mm (Figs. 1–2). This species is similar to *P. limbata* (Butler) in the superficial appearance, but can be separated from the latter by the brownish ground color and broad forewing.

Male genitalia (Fig. 17). Uncus broad and rounded at apex, with numerous hairs at apex. Tegumen broad, posteriorly rounded square. Valva rather broad, slightly angled at apex; apical area broader than basal area; costa more or less concave; sacculus abruptly narrow at terminal half; harpe well-developed, long and narrow, spatulate, with numerous hairs. Transtilla narrow, with acute process at hind margin. Saccus broad, pointed at apex. Aedeagus large, stick-shaped; cornuti well-sclerotized, two, large horn-shaped.

Female genitalia (Fig. 23). Papilla analis rather sclerotized, elliptical, with rather erect hairs.

Apophysis posterioris about 1/2 length of apophysis anterioris. Apophysis anterioris strong, with a thorn-like projection medially. Ostium bursae membranous, long funnel-shaped. Ductus bursae rather broad and long, about 3.5 times length of corpus bursae, coiled 3 times, with longitudinal sclerites and spherical distally; ductus seminalis originating from near end of ductus bursae. Corpus bursae bulb-shaped, with appendix bursae; signum rhomboidal, relatively large, with rough spinules, and with sclerotized line medially.

Material examined. GW– 1 ♂, Mt. Jeombongsan, 11 VII 1997 (Paek, Lee, Jang, Choi & Kim), UIB; 1 ♂, Mt. Weolaksan, 7 VI 1997 (Y.S. Bae & N.H. Ahn), UIB, gen. sl. no. UIB-3598(♂); 1 ♀, Temp. Hwaeomsa, Goseong, 22 VI 1999 (Bae *et al.*), UIB; 1 ♂, Bongmyeong-ri, Chuncheon, 25 VII 1999 (Bae *et al.*), UIB; 1 ♂, Mt. Daewoosan, yanggu, 14 VI 2000

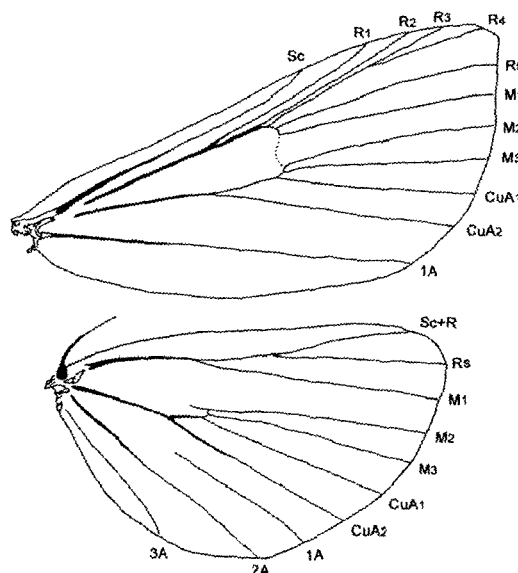


Fig. 16. Venation of *Pyrausta fuliginata* (Butler).

(M.K. Paek & Y.K. Kim), UIB. GG- 1 ♂, Is. Yongyudo, 11 VII 1997 (Paek, Lee, Ahn & Lee), UIB; 1 ♂, Temp. Yongkungsan, Is. Yeongjongdo, 21 VII 1995 (Y.S. Bae & M.K. Paek), UIB; 1 ♂, 1 ♀, Lake Daeseong, Paltan, 3 VIII 1998 (Paek & Lee), UIB; 1 ♀, Mt. Sangbongsan, Ganghwa, 7-11 VIII 1999 (Bae, Paek, & Lee), UIB; 1 ♂, Is. Yeongheungdo, Incheon, 14 VIII 1999 (Paek, Kim & Kim), UIB; 2 ♂, Is. Seonjaedo, Ongjin, 4 VII 2000 (Paek, Kim & Ko), UIB. CB- 1 ♂, 1 ♀, Lake Seungeon, Taean, 12 VII 1996 (M.K. Paek), UIB, UIB-3597(♀), UIB-3668(♀). GB- 1 ♂, Mt. Eoraesan, Youngju, 30 VI 1998 (Y.S. Bae & M.K. Paek), UIB. CN- 1 ♂, 1 ♀, Mt. Oseosan, Hongseong, 6 VIII 1999 (Bae, Lee & Kim), UIB. GN- 1 ♂, Swamp. Upo, Changnyeong, 28 VII 1997 (M.K. Paek), UIB; 1 ♀, Jusang, Geochang, 14 VIII 1998 (M.K. Paek), UIB. JN- 2 ♀, Mt. Jirisan, Jungsanri, 1976 (K.T. Park), NIAST.

Distribution. Korea (GW, GG, CB, GB, GN, JN) and Japan (Honshu).

***Pyrausta panopealis* (Walker, 1850) 들깨잎말이명나방**

(Figs. 3-4, 18, 24)

Phodaria panopealis Walker, 1859, List Spec. Lep. Ins. Coll. Br. Mus. 17: 318. TL: China.

Pyrausta phoenicealis sensu Inoue (nec Hübner), 1955, Check List Lep. Japan 2: 192; Mutuura, 1957: 125; Park, 1979: 97.

Pyrausta panopealis: Park, 1976: 13; Inoue, 1982, 1: 365, 2: 241, pl. 43: 52; Park, 1983: 368, 868, pl. 23: 373; Park, 1993: 158; Robinson *et al.* 1995: 172; Yamanaka, 1995: 183.

Synonyms: see to Bae (2001: 121).

Diagnosis. Wingspan 14-16 mm (Figs. 3-4). This species is easily distinguished from its allies by the reddish yellow and deeply bended antemedian and postmedian line of forewing.

Male genitalia (Fig. 18). Uncus narrow and pointed, with numerous hairs near apex; juxta sclerotized, a rounded square; tegumen simple. Valva broad, slightly round at apex; costa and dorsum parallel; sacculus abruptly narrow at terminal half; harpe subtrigonal, spatulate, with numerous hairs. Transtilla convex at both edges, concave medially. Saccus small, triangular, pointed at apex. Aedeagus broad, stick-shaped, about 1.5 times of valva in length; cornuti seven, thorn-shaped.

Female genitalia (Fig. 24). Papilla analis slightly sclerotized and elliptical, with numerous hairs. Apophysis posterioris about 0.7 times of apophysis anterioris in length. Apophysis anterioris with a convex projection at basal 1/4. Ostium bursae simple, membranous. Ductus bursae very short, sclerotized at distal 1/3; ductus seminalis originating from conjunction corpus bursae. Corpus bursae large, long bulb-shaped, with small appendix bursae; signum rhomboidal, relatively small, with numerous spinules, and with longitudinally sclerotized line.

Material examined. GG- 3 ♂, Lake Mulwang Shiheung, 24 VII 1996 (M.K. Paek), UIB; 1 ♀, Temp. Yongkungsan, Is. Yeongjongdo, 21 VII 1995 (Y.S. Bae & M.K. Paek), UIB-3588(♀), UIB-3667(♀); 1 ♂, Res. Naega, Ganghwa, 31 VI 1998 (N.H. Ahn), UIB; 1 ♂, 1 ♀, Lake Daeseong Paltan, 3 VIII 1998 (Paek & Lee), UIB; 2 ♂, 1 ♀, Cheongrado, Incheon, 26 VIII 1998 (Lee & Ahn), UIB, UIB-4536(♂); 1 ♂, Is. Yeongheungdo, Incheon, 14 VIII 1999 (Paek, Kim & Kim), UIB; 3 ♂, 1 ♀, Mt. Gaegunsan, Yangpyeong, 22 VIII 2000 (Bae *et al.*), UIB. CB- 1 ♂, Mt. Gayasan, 15 VI 1997 (Bae, Paek, Lee, Oh & Ahn), UIB; 2 ♂, Mt. Namsan, Chungju, 24-26 VIII 2000 (Paek, Kim & Kim), UIB. GN- 1 ♂, Swamp. Upo, 28 VII 1997 (M.K. Paek), UIB; 1 ♀, Jusang, Geochang, 14 VIII 1998 (M.K. Paek), UIB, UIB-4537(♀). GG- 2 exs, Yongin, 2 VIII 1973 (Y.I. Lee), NIAST; 1ex, Pocheon, 29 X 1989 (S.B. Ahn), NIAST; 1ex, Suweon, 27 VIII 1969 (Y.I. Lee), NIAST, 1ex, *ditto*, 12 VII 1973 (J.C. Paik), NIAST, 1ex, *ditto*, 20 VII 1974 (K.T. Park), NIAST, 1ex, *ditto*, 18 VIII 1974 (K.T. Park), NIAST, 1ex, *ditto*, 9 IX 1975 (K.T. Park), NIAST, 2exs, *ditto*, 27 V 1976 (K.B. Uhm),

NIAST, 6exs, *ditto*, 28 V 1976 (K.T. Park), NIAST, 1ex, *ditto*, 5 VI 1976 (K.T. Park), NIAST, 4exs, *ditto*, 2 VIII 1982 (C.H. Ryu), NIAST, 1ex, *ditto*, 20 VIII 1982 (C.H. Ryu), NIAST, 1ex, *ditto*, 27 VII 1982 (C.H. Ryu), NIAST, 1ex, *ditto*, 31 VIII 1982 (C.H. Ryu), NIAST, 3exs, *ditto*, 26 V 1984 (S.B. Ahn), NIAST, 2exs, *ditto*, 20 IX 1984 (H.G. Goh), NIAST, 1ex, *ditto*, 10 VIII 1987 (S.B. Ahn), NIAST, 3exs, *ditto*, 13 VIII 1988 (I.S. Kim), NIAST, 1ex, *ditto*, 19 V 1989 (S.H. Lee), NIAST, 1ex, Hwaseong, 5 VIII 1993 (S.B. Ahn), NIAST. CB- 1ex, Mt. Weolaksan, 20 VI 1984 (S.B. Ahn), NIAST, 3exs, Eumsung, 12 VIII 1974 (Y.I. Lee), NIAST, 1ex, Okdhun, 8 VIII 1973 (K.Y. Choi), NIAST, 1ex, *ditto*, 8 VIII 1973 (K.T. Park), NIAST. GN- 1ex, Milyang, 30 VIII 1974 (H.K. Kim), NIAST, 1ex, *ditto*, 3 IX 1974 (H.K. Kim), NIAST, 10exs, Jinju, 5 IX 1987 (I.S. Kim), NIAST. GN- 1ex, Mt. Sanseongsan, Goseong, 18-19 VIII 1998, GSNU; 1ex, Mt. Waryongsan, Sacheon, 11-12 VIII 1999, GSNU; 1ex, Dumunri, Jinyang, 2 VIII 1982, GSNU.

Distribution. Korea (GG, CB, GN), Japan (Honshu, Shikoku, Kyushu, Tsushima Is., Ryukyu Is.), China, Nepal, India, Thailand, Indonesia (Sumatra, Java), Philippines, Africa, Australia, and America.

Host plant. Labiatae- *Perilla frutescens* var. *japonica* Hara

***Pyrausta tithionalis* Zeller, 1872 연분홍꼬마들명나방**

(Figs. 5, 19, 25)

Botys tithionalis Zeller, 1872, Verh. Zool-bot. Ver. Wien. 1872: 504. TL: Russia (Siberia).

Botys dotatalis Christoph, 1881, Bull. Soc. Imp. Nat. Moscou 56(1): 12. TL: Russia (Amur).

Pyrausta latiplagialis Caradja, 1935, Ark. Zool. 27(A) 8: 9. TL: China.

Pyrausta tithionalis: Inoue, 1955: 193; Inoue, 1982, 1: 366, 2: 241, pl. 43: 55; Park, 1983: 369, 869, pl. 23: 375; Park, 1993: 158; Shin *et al.* 1994: 335; Chu *et al.* 1997: 143, fig. 143; Bae, 2001: 137.

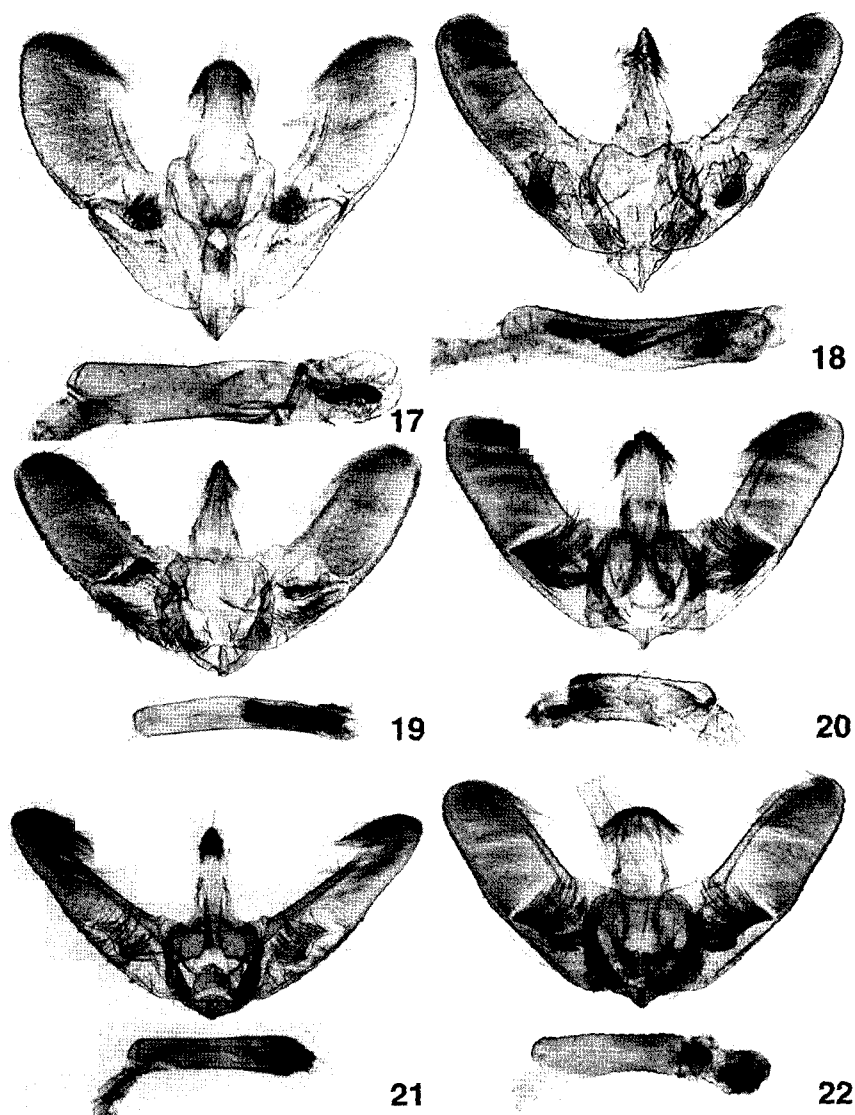
Diagnosis. Wingspan 16 mm (Fig. 5). This species is easily separated from its allies by the pale reddish forewing, with orange postmedian line and basal part.

Male genitalia (Fig. 19). Uncus narrow and pointed, with numerous hairs at apex. Juxta sclerotized, trapezoidal. Valva broad; curved at dorsum, with round apex; sacculus simple, with numerous hairs at terminal 2/3; harpe long, band-like, with numerous hairs. Transtilla convex at both edge; concave medially. Saccus rounded. Aedeagus rather narrow, stick-shaped, about same length of valva; cornuti seven, a sheaf of fibriform.

Female genitalia (Fig. 25). Papilla analis narrow, with few hairs. Apophysis posterioris about 1.3 times apophysis anterioris in length. Apophysis anterioris with a convex projection at basal 1/3. Ostium bursae membranous, broad. Ductus bursae well-sclerotized at anterior 2/3, with large sack near corpus bursae; ductus seminalis originating from conjunction with corpus bursae. Corpus bursae rounded, with large appendix bursae; signum asteroid, relatively small, with numerous spinules, and with longitudinally sclerotized line.

Material examined. GW- 1 ♂, Mt. Chiaksan, 16 VII 1998 (Bae, Ahn & Kim), UIB; 1 ♂, Mt. Gariwangsan, 8 VII 1998 (Paek, Lee, Kim & Song), UIB; 1 ♂, Bongmyeongri, Chuncheon, 25 VII 1999 (Bae *et al.*), UIB; 1 ♂, Mt. Baekseoksan, Yanggu, 18 VII 2000 (Paek, Kim & Yu), UIB. GG-1 ♂, Mt. Gwangdeoksan, 19 VIII 1997 (M.K. Paek & W.Y. Jang), UIB; 1 ♂, Mt. Hwaaksan, Gapyeong, 19 VIII 1998 (Bae, Lee & Kim), UIB-3608(♂), 1 ♂, *ditto*, 17 VIII 2000 (Y.S. Bae & B.W. Lee), UIB. JN- 1 ♀, Mt. Baegunsan, Gwangyang, 19 VII 1998 (Bae, Paek, Lee, Ahn, Kim & Song), UIB-3607(♀). GW- 1ex, Chuncheon, 9 IX 1988 (K.T. Park), CIS. JB- 1ex, Ninju, 13 VIII 1975 (K.T. Park), CIS.

Distribution. Korea (GW, GG, JB, JN), Japan (Hokkaido, Honshu, Kyushu, China, and Russia (Amur, Siberia).



Figs. 17-22. *Pyrausta* spp., male genitalia: 17. *P. fuliginata* Yamanaka; 18. *P. panopealis* (Walker); 19. *P. tithionalis* Zeller; 20. *P. unipunctata* Butler; 21. *P. limbata* (Butler); 22. *P. nigrimaculata* Bae et Kim, sp. nov.

***Pyrausta unipunctata* Butler, 1881** 앞무늬들명나방
(Figs. 7-8, 20, 26)

Pyrausta unipunctata Butler, 1881, Trans. Ent. Soc. London 1881: 584; Inoue, 1955: 175; Mutuura, 1957: 125; Lee & Park, 1958: 8; Zool. Soc. Kor. 1968: 54; Park, 1979: 97; Inoue, 1982, 1: 366, 2: 241, pl. 43: 57; Park, 1983: 369, 869, pl. 23: 374; Park, 1993: 157; Shin *et al.*, 1994: 335; Bae, 2001: 137. TL: Japan (Yokohama).

Diagnosis. Wingspan 16–18 mm (Figs. 7–8). This species is easily separated from the other species by the blackish forewing with orangeish fascia on the costal 2/3.

Male genitalia (Fig. 20). Uncus moderate, with numerous hairs at apex. Tegumen rounded. Valva broad, slightly round at apex; costa and dorsum parallel; harpe finger-shaped, with numerous hairs. Transtilla convex at both edges, concave medially; sacculus abruptly narrowed at distal 1/3. Saccus short, pointed at apex. Aedeagus broad, short, shorter than valva; cornuti two or three thorn-shaped lobes.

Female genitalia (Fig. 26). Papilla analis narrow, simple, with numerous hairs. Apophysis posterioris as long as apophysis anterioris. Apophysis anterioris with a convex projection near basal 1/3. Ostium bursae simple, sclerotized. Ductus bursae very long, coiled about ten times; ductus seminalis originating from near end of ductus bursae. Corpus bursae elliptical, with appendix bursae; signum slender, rhomboidal, with sclerotized line at middle part; about 1/3 length of corpus bursae.

Material examined. GW- 1 ♀, Bongmyeongri, Chuncheon, 25 VII 1999 (Bae *et al.*), UIB-3671 (♀). GG- 1 ♀, Is. Deokjeokdo, 24 VI 1997 (Y.S. Bae & N.H. Ahn), UIB; 1 ♂, Mt. Myeongseongsan, Cheolweon, 20 VII 1999 (Paek, Lee & Oh), UIB; 2 ♂, Mt. Baekseoksan, 18 VII 2000 (Paek, Kim & Yu), UIB. GB- 1 ♀, Mt. Sokrisan, 17 VII 1998 (Paek, Ahn & Kim), UIB; 1 ♂, Mt. Baekamsan, Yeongyang, 15 VII 1999 (Lee, Kim & Kim), UIB. GN- 1 ♂, 3 ♀, Swamp. Upo, Changnyeong, 28 VII 1997 (M.K. Paek), UIB-3586 (♂), UIB-3666 (♂). JN- 4 ♂, Mt. Baegunsan, Gwangyang, 19 VII 1998 (Bae, Paek, Lee, Ahn, Kim & Song), UIB. JB- 1 ex, Muju, 12 VIII 1975 (J.C. Paik), NIAST. JJ- 1 ex, Jeju, 5 VII 1986 (K.T. Park), NIAST; 1 ex, Seogwipo, 5 VII 1986 (K.T. Park), NIAST. GN- 1 ex, Okgye, Geoje, 17 VIII 1985, GSNU; 9 exs, Mt. Jwaisan, Goseong, 19-20 VIII 1998, GSNU; 1 ex, Is. Changseondo, Namhae, 5 V 1981, GSNU; 1 ex, Seongnaeri, Sancheong, 3-4 VI 1992, GSNU; 1 ex, Mt. Gajisan, Ulju, 4 VIII 1986, GSNU; 1 ex, Mt. Weolaksan, Jinju, 13-14 VIII 1999, GSNU; 3 exs, Cheonjebong, Haman, 19-20 VI 1999, GSNU; 4 exs, Chuseongri, Hamyang, 29-30 VII 1992, GSNU. JJ- 1 ex, Mt. Hanlasan, Seongpaak, Namjeju, 8 VIII 1981, GSNU; 2 exs, Temp. Gwaneum, Jeju, 6 VIII 1981, GSNU; 3 exs, Hae-an, Jeju, 12 VIII 1981, GSNU.

Distribution. Korea (GW, GG, GB, GN, JB, JN, JJ), Japan (Hokkaido, Honshu, Shikoku, Kyushu, Tsushima Is., Ryukyu Is.), and China.

Pyrausta neocespalis Inoue, 1982 갈색꼬마들명나방

(Figs. 8-9, 27)

Pyrausta neocespalis Inoue, 1982, 1: 366, 2: 241, pl. 43: 53; Park, 1983: 369, 869, pl. 23: 376; Chu *et al.* 1997: 143, fig. 141; Bae, 2001: 135. TL: Japan.

Pyrausta cespalis: Park, 1979: 97.

Pyrausta despicata: Park, 1993: 158.

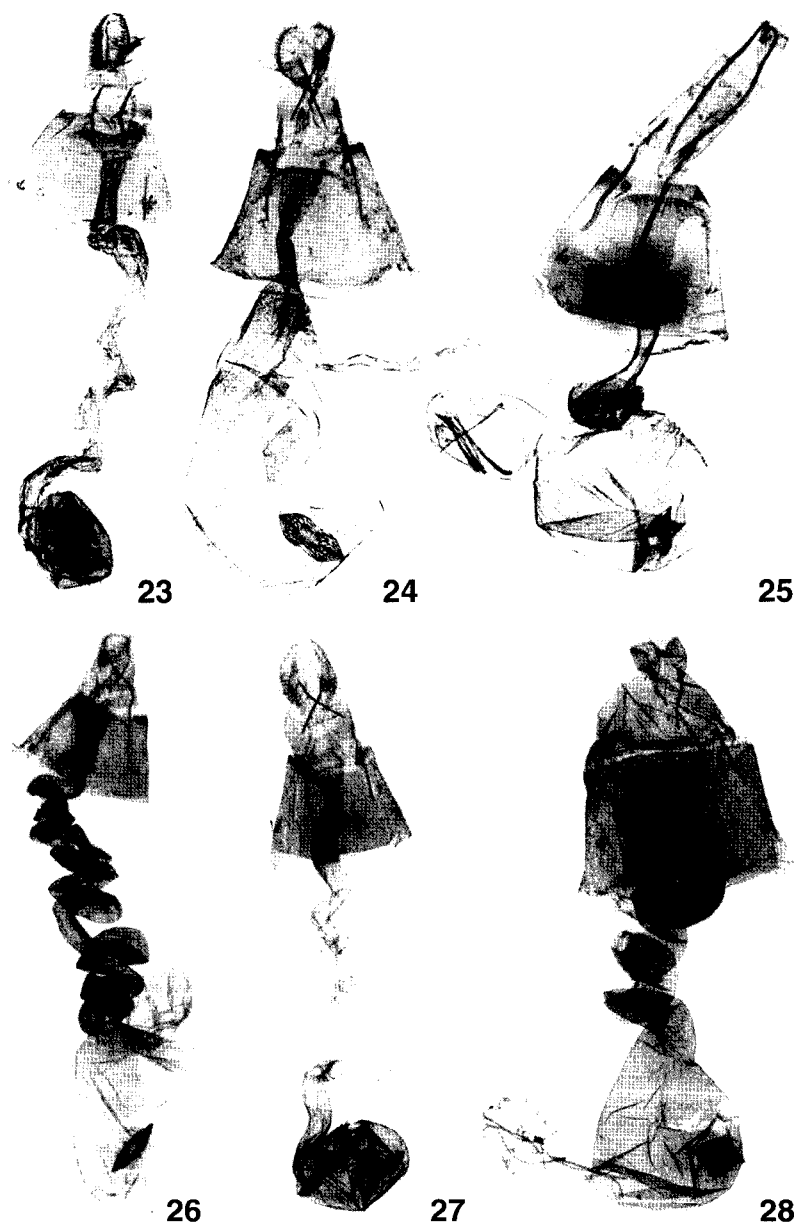
Diagnosis. Wingspan 16mm (Figs. 8-9). This species is somewhat variable in the color of wings and can be separated from its allies by the distinct postmedian line.

Female genitalia (Fig. 27). Papilla analis weakly sclerotized, elliptical. Apophysis posterioris shorter than apophysis anterioris. Apophysis anterioris with a convex projection at basal 1/3. Ostium bursae sclerotized posteriorly. Ductus bursae long, about 3 times of corpus bursae in length, coiled 4 times; ductus seminalis originating from near end of ductus bursae. Corpus bursae elliptical; appendix bursae relatively large; signum long, rhomboidal, with sclerotized line at middle.

Material examined. GW- 1 ♀, Mt. Gyebangsan, 14 VIII 1998 (Bae, Lee & Ahn), UIB. GG- 1 ex, Gwangleung, 7 VIII 1982 (Won), CIS. GW- 1 ex, Daegwanryeong, 24 VII 1974 (K.S. Woo), NIAST. GN- 1 ex, Mt. Bibongsan, Jinju, 25 V 1984, GSNU.

Distribution. Korea (GW, GG, GN), Japan (Honshu, Kyushu), and China.

Remarks. The male specimen is not collected from Korea.



Figs. 23-28. *Pyrausta* spp., female genitalia: 23. *P. fuliginata* Yamanaka; 24. *P. panopealis* (Walker); 25. *P. tithionalis* Zeller; 26. *P. unipunctata* Butler; 27. *P. neocespitalis* Inoue; 28. *P. chrysitis* Butler.

***Pyrausta chrysitis* Butler, 1881 육점검정들명나방**
(Figs. 10, 28)

Pyrausta chrysitis Butler, 1881, Trans. ent. Soc. Lond. 1881: 584; Inoue, 1982, 1: 367, 2: 241, pl. 44: 8; Bae, 2001: 138.

Diagnosis. Wingspan 17 mm (Fig. 10). This species is similar to *Pyrausta aurata* (Scopoli), but differs from it by the gradually narrower antemedian line of hindwing.

Female genitalia (Fig. 28). Papilla analis elliptical, with some short hairs. Apophysis posterioris more or less shorter than Apophysis anterioris. Ostium bursae large, hat-shaped. Ductus bursae long, broad, well-sclerotized at posterior 2/3, coiled about 3 times; ductus seminalis originating from the end of sclerotized part of ductus bursae. Corpus bursae moderate in size; appendix bursae relatively large; signum large, subrectangular, with sclerotized line at middle part.

Material examined. GW: 1 ♀, Mt. Baekseoksan, Yanggu, 13 VI 2000 (M.K. Paek & Y.K. Kim), UIB-3672 (♀).

Distribution. Korea (GW) and Japan (Shikoku, Kyushu).

Remarks. This species is only one female specimen collected for the first time from Korea.

Pyrausta mutuurai Inoue, 1982 진도들명나방

(Figs. 11, 29)

Pyrausta mutuurai Inoue, 1982, 1: 367, 2: 241, pl. 44: 9; Park, 1983: 370, 869, pl. 23: 377; Bae, 2001: 135. TL: Japan.

Pyrausta sikkima sensu Park (nec Moore), 1976, Korean Jour. Ent. 6(2): 13.

Diagnosis. Wingspan 14 mm (Fig. 11). This species can be separated from its allies by the large yellowish markings on the forewing and hindwing.

Female genitalia (Fig. 29). Papilla analis membranous, narrow, elliptical. Apophysis posterioris about 1/2 length of apophysis anterioris. Ostium bursae cylindrical, well-sclerotized. Ductus bursae long, about 5 times length of corpus bursae, coiled 7 times; ductus seminalis originating from near end of ductus bursae. Corpus bursae more or less small, elliptical; appendix bursae about same size in corpus bursae; signum rhomboidal, with sclerotized line at middle.

Material examined. GG- 1 ♀, Mt. Hwayasan, 21-22 VIII 2001 (C.M. Lee), UIB-3673 (♀). GW- 1 ♀, Jeongseon, 30 VII 1991 (K.T. Park), CIS; 1 ♀, Mt. Yonghwasan, Chuncheon, 29 VI 1995 (K.T. Park), CIS. GG- 1 ex, Mt. Myeongjisan, 22 V 1986 (Lee & Min), CIS. JN- Is. Jindo, 10 VII 1973 (K.T. Park), NIAST.

Distribution. Korea (GW, GG, JN) and Japan (Honshu, Kyushu).

Remarks. This species is one of the rare species in Korea.

Pyrausta limbata (Butler, 1879) 검정꼬마들명나방

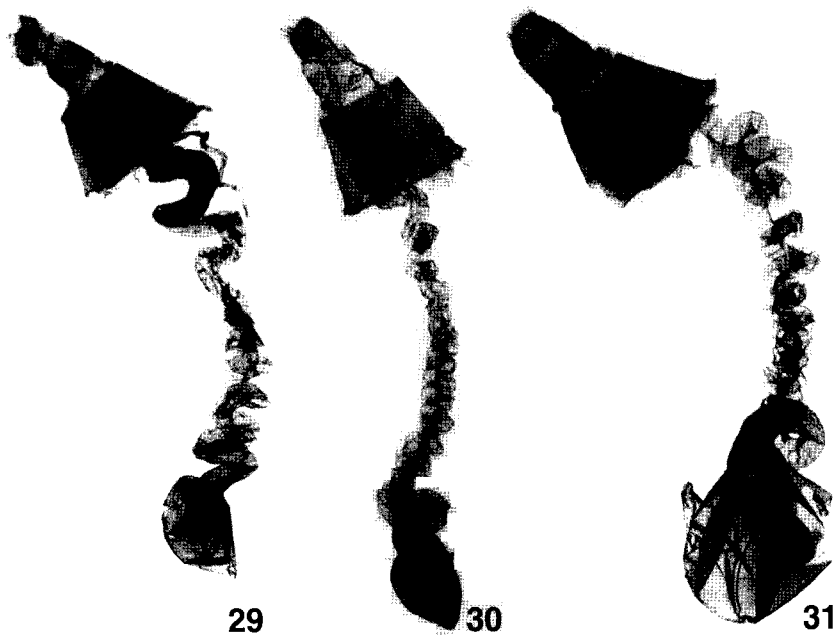
(Figs. 12-13, 21, 30)

Ennychia limbata Butler, 1879, Ill. Spec. Lep. Het. Coll. Br. Mus. 3: 73. TL: Japan (Yokohama).

Pyrausta limbata: Mutuura, 1957: 124; Inoue, 1982, 1: 367, 2: 241, pl. 44: 4, 5; Park, 1983: 370, 869, pl. 24: 378; Park, 1993: 158; Bae, 2001: 135.

Diagnosis. Wingspan 14-17 mm (Figs. 12-13). This species is very similar to *Pyrausta fuliginata* Yamanaka in the superficial appearances, but can be distinguished from the latter by the lustrous blackish ground color of the wings.

Male genitalia (Fig. 21). Uncus narrow, pointed, with numerous hairs at apex; juxta sclerotized, rounded. Valva simple, narrower apically, with rounded apex; harpe slender, weakly curved, with a row of numerous hairs. Transtilla membranous, long; sacculus narrow, abruptly broad at basal 1/3. Saccus very small triangular, pointed at apex. Aedeagus large, simple stick-shaped, about same times of valva; cornuti composed with about 22 canine tooth projections.



Figs. 29-31. 29. *Pyrausta mutuurai* Inoue; 30. *P. limbata* (Butler); 31. *P. nigrimaculata* Bae et Kim, sp. nov.

Female genitalia (Fig. 30). Papilla analis membranous, elliptical, with numerous hairs. Apophysis posterioris about 1/3 length of apophysis anterioris. Ostium bursae membranous, wide cup-shaped. Ductus bursae very long, about 8 times length of corpus bursae, sclerotized near ostium bursae, coiled 14–16 times; ductus seminalis originating from end of ductus bursae. Corpus bursae bulb-shaped, with small appendix bursae; signum rhomboidal, with sclerotized line at middle. moderate in size.

Material examined. GW– 1 ♀, Mt. Jeombongsan, 5 VIII 1997 (Y.S. Bae & N.H. Ahn), UIB; 2 ♂, Mt. Chiaksan, Weonju, 5 VIII 1998 (N.H. Ahn & Y.K. Kim), UIB; 5 ♂, 2 ♀, Mt. Baekseoksan, Yanggu, 18 VII 2000 (Paek, Kim & Yu), UIB–3669(♀), 3670(♂). GG– 1 ♀, Mt. Godaesan, Yeoncheon, 27 V. 2000 (Bae, Lee, Oh & Lee), UIB; 1 ♂, Yongin, 17 VIII 2000 (M.K. Paek & Y.K. Kim), UIB. GG– 1 ex, Gwangleung, 28 VII 1983 (G.J. Weon), FRI.

Distribution. Korea (GW, GG), Japan (Hokkaido, Honshu, Shikoku, Kyushu, Tsushima Is.), China, and Russia (Siberia).

***Pyrausta nigrimaculata* Bae et Kim, sp. nov. 노랑띠무늬들명나방 (신칭)**

(Figs. 14–15, 22, 31)

Pyrausta sp. 1: Bae, 2001. Ins. Kor. Suppl. 16: 138.

Diagnosis. This new species is rather similar to *P. chrysitis* Butler in the shape and the markings of wings, but can be separated from the rather by the yellowish wide fascia on the postmedian part of the wings.

Adult (Figs. 14, 15). Wingspan 19–21 mm. Head dark brown; frons ochreous, with yellowish white line at both edge. Labial palpus short, porrect, with pointed apex. Antenna filiform; cilia of flagellum short in male, simple in female. Proboscis admixed with numerous

scales at basal part. Thorax dark fuscous brown dorsally, yellowish white ventrally. Outer spur of midlegs variable: male about 1/2 length of inner spur; female about 1/3 as inner spur. Outer median spur of hindlegs: male about 0.2 times as long as inner median spur; female about 0.3 times as long as inner median spur. Ground color of wings dark fuscous brown. Forewing with large yellowish marking on postmedian part; cilia dark brown. Hindwing with medially yellowish band-like marking, the marking dorsally narrower; cilia dark brown at termen, fuscous yellow near apex and dorsum.

Male genitalia (Fig. 22). Uncus moderate in length, sides almost parallel, broadly rounded at apex, with numerous hairs at apex. Tegumen broad, posteriorly rounded square. Valva broad; costa almost straight; dorsum curved at middle; sacculus narrow, abruptly broad near basal 1/3; harpe triangular with numerous hairs. Transtilla convex at both edges; straight at middle. Saccus broad, pointed at apex. Aedeagus broad, stick-shaped; with two cornuti, armed with numerous small thorns.

Female genitalia (Fig. 31). Papilla analis sclerotized, elliptical, with numerous hairs. Apophysis posterioris about 2/3 length of apophysis anterioris. Apophysis anterioris thick, with a thorn-like projection at basal 1/3. Ostium sclerotized. Ductus bursae coiled about 14 times; ductus seminalis membranous, originating from near end of ductus bursae. Corpus bursae bulb-shaped, with appendix bursae medially; signum rhomboidal, with sclerotized line at middle, about 1/3 length of diameter of corpus bursae.

Material examined. Holotype: male, Mt. Tonggosan, Uljin, Gyeongsangbukdo, Korea, 26–31 VI 2000 (Bae *et al.*), UIB–3663(♂). Paratypes: GW–1♂, Mt. Jeombongsan, 12 VIII 1997 (Paek, Lee, Jang, Choi & Kim), UIB; 1♂, Mt. Balgyosan, Hweingseong, 7 VII 1998 (Paek, Lee, Kim & Song), UIB; 1♂, Mt. Maebongsan, Inje, 24 VI 1999 (Lee, Kim & Kim), UIB; 1♂, Mt. Baekseoksan, Yanggu, 13 VI 2000 (M.K. Paek & Y.K. Kim), UIB, 1♂, *ditto*, 18 VII 2000 (Paek, Kim & Yu), UIB; 1♂, Unduryeong, 20 VII 2000 (Bae, Lee & Lee), UIB; 1♀, Mt. Daewoosan, Yanggu, 17 VII 2000 (Paek, Kim & Yu), UIB; 1♂, Mt. Odaesan, Pyeongchang, 2 VI 2001 (Bae, Kim & Kim), UIB; 1♂, Mt. Sambangsan, Yeongweol, 9 VII 2001 (Bae, Kim & Lee), UIB. GG–1♂, Mt. Godaesan, Yeoncheon, 11 VII 2000 (Paek, Kim, Kim & Ko), UIB, 1♂, *ditto*, 17–19 VII 2000 (Bae *et al.*), UIB; 1♀, Mt. Hwaak, Gapyeong, 17 VIII 2000 (Y.S. Bae & B.W. Lee), UIB. CB–2♂, Mt. Namsan, 24–26 VIII 1997 (Paek, Kim & Kim), UIB. GB–1♂, Mt. Baekamsan, Yeongyang, 15 VII 1999 (Lee, Kim & Kim), UIB. GW–1♂, Seomyeon, Yangyang, 25 VII 1987 (K.T. Park), CIS; 2♂, 1♀, Sogumgang, 7 VII 1988 (K.T. Park), CIS; 2♂, Chuncheon, 12 VIII 1988 (K.T. Park), CIS; 1♂, Mt. Taehwasan, Yeongweol, 27 V 1998 (Lee & Jung), CIS. JJ–1♂, Seongpanak, 23 VIII 1992 (K.T. Park), CIS. GG–1♂, Mt. Cheonggyesan, 8 VIII 1976 (K.T. Park), NIAST. GB–1♀, Muju, 13 VIII 1975 (K.T. Park), NIAST. GB–1ex, Mt. Cheongryangsan, Bonghwa, 31 VII 1986, GSNU; 1ex, Temp. Gowunsa, Uiseong, 4 VIII 1986, GSNU.

Distribution. Korea (GW, GG, GB).

Etymology. The specific name is in reference to the extremely blackish wing.

Pyrausta aurata (Scopoli, 1763) 구점들명나방

Phalaena aurata Scopoli, 1763, Ent. Carniolica: 227. TL: [Europe].

Pyrausta sikkima sensu Inoue (nec Moore), 1959, in Inoue *et al.* Iconographia Insectorum Japonicorum Colore naturali Edita 1: 256, pl. 173: 9.

Pyrausta aurata: Inoue, 1982, 1: 367, 2: 239, pl. 44: 7; Park, 1993: 157; Shin *et al.* 1994: 335; Martin, 1986: 387, Figs. 393: 1, 2, 396: 3; Bae, 2001: 134.

Distribution. Korea, Japan (Hokkaido, Honshu), Russia (Soviet, Siberia, Primorye), Asia Minor, Iran, Afghanistan, Mongolia, and Europe.

Host plant. Europe: Labiatae– *Mentha* spp. (Emmet, 1991).

Remarks. This species was reported by Park (1993), based on North Korean specimens deposited in the Hungarian Museum of Natural History, but no further specimen has been collected in South Korea to date.

***Pyrausta contigualis* South, 1901** 펙크무늬들명나방

Pyrausta contigualis South, 1901, in Leech. Trans. ent. Soc. London 1901: 506, pl. 14: 23; Inoue, 1982, 1: 366, 2: 241, pl. 43: 54; Park, 1993: 158; Shin *et al.* 1994: 335; Bae, 2001: 134. TL: China.

Diagnosis. This species is similar to *P. panopealis* (Walker) in the superficial appearance, but it can be distinguished from the latter by the large reddish bend on median area of forewing and deeply brownish color on the only external area of the hindwing.

Distribution. Korea, Japan (Kyushu), and West China.

Remarks. This species was reported by Park (1993), based on North Korean specimens deposited in the Hungarian Museum of Natural History, but no further specimen has been collected in South Korea.

***Pyrausta noctualis* Yamanaka, 1978** 곤은줄황들명나방

Pyrausta noctualis Yamanaka, 1978, Tinea 10: 194, Figs. 3, 9, 19; Inoue, 1982, 1: 367, 2: 241, pl. 44: 3; Park, 1993: 157; Shin *et al.* 1994: 335; Bae, 2001: 136. TL: Japan.

Distribution. Korea, Japan (Honshu).

Remarks. This species was reported by Park (1993), based on North Korean specimens deposited in the Hungarian Museum of Natural History, but no further specimen has been collected in South Korea to date.

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